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BULLETIN OF THE UNIVERSITY OF SCRANTON

VOLUME 53 APRIL 1968 NUMBER 2

THE GRADUATE SCHOOL

M.A., M.S. and M.B.A. Degrees — Business Administration, English, Education, History, Physics, Chemistry

FOR MEN AND WOMEN

SCRANTON, PENNSYLVANIA

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Scranton, Pennsylvania

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* Pro Deo Et Universitate Award for Twenty Years of More of Service.

GRADUATE CALENDAR

1968-1969

FALL SEMESTER

September 12, 13, 14	Registration, Fall Semester
September 16	Fall semester begins
September 23	Final day for late registration and change of course
October 18 & 25	Comprehensive and Candidacy Examinations, 7-10 p.m.
November 1	Holy Day — no class
November 28, 29, 30	Thanksgiving Holidays
December 14	Christmas Holidays begin after last class
January 6	Classes resume
January 20 - 25	Semester Examinations

SPRING SEMESTER

January 30, 31, February 1	Registration, Spring Semester
February 3	Spring semester begins
February 10	Final day for late registration and change of course
February 22	Washington's Birthday — Holiday
March 21 & 28	Comprehensive and Candidacy Examinations, 7-10 p.m.
March 29	Easter Holiday begins after last class
April 9	Classes resume
April 26	Last day for submission of Graduate Thesis
May 15	Holy Day — no class
May 23 to 29 inclusive	Semester Examinations
May 31	Baccalaureate Mass
June 1	Commencement

COLLEGE MISERICORDIA CALENDAR

FALL SEMESTER — 1968

September 5, 6, 7	Registration, Fall Semester
September 21	Fall Semester begins
September 30	Final day for late registration or change of course
November 30	Thanksgiving Holiday
December 14	Christmas Holidays begin after last class
January 4	Classes Resume
January 25	Semester Examinations

SPRING SEMESTER — 1969

January 23, 24, 25	Registration, Spring Semester
February 1	Spring Semester begins
February 8	Final day for late registration or change of course
March 29	Easter Holidays begin after last class
April 12	Classes Resume
May 24	Semester Examinations

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* Pro Deo et Universitate Award of Vicennial Service

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COLLEGE MISERICORDIA

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General Information

The University of Scranton, the oldest Catholic institution of higher education in Northeastern Pennsylvania, was founded in 1888 as Saint Thomas College. It is chartered under the laws of the Commonwealth of Pennsylvania and empowered to confer Bachelor's and Master's degrees in the Arts, Sciences, Business Administration and Education. In 1938 Saint Thomas College became the University of Scranton, while four years later the Society of Jesus acquired title from the Catholic Diocese of Scranton and administrative control from the Brothers of the Christian Schools. Thus Scranton became the twenty-fourth of the twenty-eight Jesuit colleges and universities in the United States.

In 1950 graduate study in Education was initiated, the first Master's degrees being awarded in June, 1952. Since that time more extensive programs were developed in Elementary Education, Psychology and Guidance, Educational Administration. Through courses at the University's Graduate School several State Certificates may be obtained. A graduate History program was first offered in 1955, while graduate curricula in English and in Business Administration are of 1960 origin. Graduate programs in Chemistry and Physics began in the Fall of 1967.

Today the University of Scranton conducts graduate study leading to the following degrees:

Master of Arts (thesis) and Master of Science (non-thesis) in Elementary and Secondary Education, Elementary and Secondary School Administration, Counselor Education, Reading, Rehabilitation Counseling and Secondary Education-English or History Correlated Programs, Physics and Chemistry. Master of Arts in English and in American History and Politics; also Chemistry and Physics.

Master of Business Administration

OBJECTIVES

As one of the family of world wide Jesuit Colleges and Universities, the University of Scranton shares with them a common educational heritage and tradition. Its principal objective, therefore, is: 1) to lead the student to understand and to inspire him to fulfill that complex of dignities and responsibilities which Man is, as a person and as a member of human society, under God; 2) harmoniously to develop all his powers of soul and body, under the influence of Divine Grace, by methods of teaching which will form habits of correct and vigorous thinking, and of courageously effective and virtuous acting.

Specifically, as the university in this community, the University of Scranton labors to prepare its students to be thoughtful, active, effective citizens with a developed sense of leadership and a dedicated spirit of community service in the arts and professions.

More particularly, the Graduate School of this University aims 1) to communicate, interpret, intensify and integrate academic knowledge and relationships; 2) to develop professional attitudes, skills and competence in the student's chosen area of concentration; 3) to foster those value judgments so basic to human life and education — values which flow not only from a given discipline but also from Christian revelation and the Judaeo-Graeco-Roman, Western moral and intellectual tradition; 4) to encourage research to the extent practicable with faculty and facilities.

ORGANIZATION AND LOCATION

The administration and supervision of the Graduate School is the responsibility of the Dean of the Graduate School. He is assisted by a Graduate Advisory Committee, of which he is chairman. The other regular members of this committee are the Registrar of the University and the Chairmen of the various Graduate Departments: Business Administration, Education and Psychology, English, History, Physics and Chemistry. All questions concerning admission, failure of candidacy and comprehensive examinations or modifications of course programs, will be submitted in writing to the Dean of the Graduate School. Decisions of the Dean of the Graduate School and his Advisory Committee are final.

Requests for transcript, letters to draft boards and data concerning academic records should be made to the Graduate Office, University of Scranton.

The office of the Dean of the Graduate School is Room 308 St. Thomas Hall, Monroe & Linden Street. The office of the Reg-

istrar, Room 301, is open from 8:30 A.M. to 4:30 P.M. Monday through Friday and on Saturday until noon.

There are three regular semesters of graduate courses: Fall, Spring and Summer. Fall and Spring graduate courses are taught each evening, except Friday, at Monroe & Linden Street from 7:00 to 9:00 P.M. and on Saturdays from 9:00 A.M. to 1:00 P.M. During the Summer term, graduate classes are scheduled from 8:30 A.M. to 9.35 P.M. Monday through Thursday for six weeks.

Time schedules for each course appear in the special bulletins published three times each year for Fall, Spring and Summer programs.

COLLEGE MISERICORDIA

According to a cooperative agreement for graduate programs, the University of Scranton Graduate School and College Misericordia, Dallas, Pa., will offer several courses during the Summer, Fall and Spring Semesters on the campus of College Misericordia. During the summer sessions, classes will be conducted on the same time schedule as the U. of S. During the Fall semester and the Spring term the claases will be scheduled on Saturdays from 9 A.M. to 1 P.M.

Application for admission to graduate study must be made to the University of Scranton. The faculty will be members of the cooperating schools. Credits are granted by the University of Scranton. Up to fifteen credits toward the M.A. or M.S. degrees may be acquired at College Misericordia while the remaining credits must be obtained at the University of Scranton. Charges at the cooperating schools are identical. So also are the candidacy and comprehensive examinations, course numbering, content and credits, curriculum and departmental requirements. Courses at both Scranton and Dallas are open to men and women.

APPLICATIONS

All planning to enter the Graduate School should contact the Graduate Office for an application blank. Completed applications, together with transcripts of undergraduate and graduate work taken elsewhere, should be in the Graduate Office one month before the applicant begins graduate study. No student will be permitted to register for courses until his credentials have been received, nor are students formally admitted to graduate instruction until they receive official notification.

Students who are not matriculating for the advanced degree, will fulfill the same admission requirements as degree students. Those who intend to transfer credits elsewhere must present written, official authorization from the other graduate school to follow courses here.

Admissions standards and policy of the University are free of discrimination on ground of race, color and national origin.

REGISTRATION FOR COURSES

Registration for each semester will take place on three days prior to the opening of the semester classes, from 3:00-4:30 P.M. and 7:00-9:00 P.M. and on Saturday 9:00 A.M. -12:00 noon. Mail registration is permitted after the initial acceptance and registration. Registration will be with the approval of a student's mentor or chairman of the department. A student may not drop or transfer from a course in which he is registered without the approval of his mentor and the Dean.

In order to facilitate registration for old and new students a period of pre-registration will be announced each semester. This will extend over a period of about 10 days and all graduate students taking courses during the current semester must register between the announced dates. Those who do not register and have an insufficient excuse will be charged a late registration fee of $15.

New students, and old students not currently registered, may not register during this period. The registration schedule shown on the next page is set aside for them.

Students in this category who register after six working days have elapsed from the day and including the day classes begin will be charged the late registration fee of $15. No student may register late without special permission of the Dean.

Registration schedule for various Departments
Mentors available for consultation

	Education Chemistry Physics	Business	English	History
Thursday				
3:00-4:30 P.M.	*			
7:00-9:00 P.M.	*	*	*	*
Friday				
3:00-4:30 P.M.	*			
7:00-9:00 P.M.	*	*	*	*
Saturday				
9:00-12:00 noon	*	*	*	*

CANDIDACY

The student is considered an unclassified graduate student until he fulfills the following requirements:

1. Completes successfully at least nine semester hours of course credit at the University of Scranton.
2. Files a formal application for degree candidacy with the Dean.
3. Is approved by the department in the field of his major concentration according to departmental norms.

From the inception of graduate study, he will be assigned a mentor to help him formulate a program of studies and supervise his work. **The arrangement of conferences with his mentor is the responsibility of the graduate student.**

GRADES

Achievement of Graduate Students is recorded as A-excellent, B-good; C-fair but passing; F-failure. To insure qualitative standards a student incurring 4 "C"s or 3 "C"s and an "F" ceases to be a candidate for a degree but may continue to take courses for information, self-improvement or credit. A student who fails any two courses will be automatically dismissed and so notified by mail.

Papers, reports and assignments should be rendered promptly, and permission of the professor is required for deferral of such work. Given an extension, the student should submit all required work no later than one month after the end of the semester. Failure to complete the work within the stipulated time results in automatic conversion of the "Incomplete" to failure (F).

Regular attendance at class is considered a requisite for successful completion of a course.

TIME LIMIT

All graduate work including the thesis must be completed within six consecutive years. Time spent in the armed forces is not included in the six year period.

INSTITUTES

From time to time the University conducts special programs for teachers-in-service. Graduate or undergraduate credit may be gained by successful work in the programs, but in the case of the graduate student, no more than eight credits of the advanced degree work may be earned in the institutes.

TRANSFER OF CREDITS

After a student has acquired candidacy status he may request that approved graduate work previously completed at other institutions be accepted as partial fulfillment of graduate course requirements here. This will be granted only under the following conditions:

1. That such credits were acquired in residence at the other institution. Extension credits are not acceptable.
2. That only six (6) credits maximum be transferred;
3. That courses to be transferred parallel courses here and mesh with the student's program at the University of Scranton.
4. That these credits were taken within six (6) years of the student's admission.
5. That a grade of B or better was acquired in these courses and that an official transcript is submitted for work at other institutions.

Students matriculated at the University of Scranton may follow courses at other approved graduate schools, and transfer credits only with the previous permission of their mentor and the Dean of the Graduate School.

COMPREHENSIVE EXAMINATIONS

Before a Master's degree is awarded, the candidate must pass a comprehensive examination in his graduate course work. This examination may be either oral, written or both. Eligibility for admission to the examination is determined by the student's mentor with the approval of the Department Committee. This examination will be given only on the dates published in the Graduate Catalogue. Application forms are obtainable at the Graduate Office. Completed forms are then filed with the Graduate Office.

Several weeks before the examination date, the candidate should consult his mentor for a general explanation of the topics to be covered in the examination and file an application for the examination.

Candidates failing the comprehensive examination for the second time will not be considered for the advanced degree.

The results of the comprhensive examination will be forwarded to the candidate by mail.

THESIS

Candidates for the Master of Arts degrees in Education, English, History, Physics or Chemistry must present a thesis, completed under the active supervision of the candidate's mentor and approved by one additional reader. In case of doubt, a third reader may be required. In the preparation of the thesis, style regulations prescribed by the Graduate School will be observed. Two copies of the accepted thesis must be submitted to the Graduate School of the University of Scranton on or before the date indicated in the University Calendar. These become the property of the University and permission to publish them in their original or modified form must be secured from the Dean of the Graduate School.

SUMMARY

The following procedures are to be followed by students working for the advanced degree:

1) File an application for admission to graduate study, official transcripts of undergraduate preparation and of graduate credits taken elsewhere, and supporting recommendations.

2) Meet with the mentor to organize a program of studies in the major course concentration selected. Confirm the program at each registration period.

3) Apply for candidacy for the degree by fulfilling requirements.

4) Complete core, specific major and elective courses.

5) Complete the required thesis if a candidate for the M.A. degree.

6) Successfully pass the required comprehensive examination.

7) Make formal application to the Graduate office for the degree.

ALUMNI MEMORIAL LIBRARY

The library is located on the Scranton Estate. It contains more than 110,000 bound volumes, with over 700 literary, scientific and professional periodicals currently received Microfilm and micro card reading equipment is available, as well as, interlibrary loan.

The library is open daily during the Fall and Spring Semesters from 8:30 A.M. to 11:00 P.M., Monday to Thursday; 8:30 A.M. to 5:00 P.M. on Friday; 9:00 A.M. to 5:00 P.M. on Saturday, During the Summer Semester the hours are the same with the exception of a 9:00 A.M. opening hour each day. The library is open on Sundays from 3:00 to 9:00 P.M.

GUIDANCE AND PLACEMENT

The University's guidance, financial aid and placement services are available to graduate students. The Guidance Department is located in St. Thomas Hall, Room 401; Placement Office in Room 402, the Financial Aid Office in 406. All offices are open on weekdays from 8:30 A.M. to 4:30 P.M. and at other times only by appointment.

EXPENSES

GRADUATE SCHOOL

Tuition (per semester hour of credit)	$44.00
Fees —	
Admission Fee	10.00
Library Fee (per semester)	5.00
Science Lab Fee	25.00
Late Registration	15.00
Audio-Visual Aids Fee	5.00
Binding of Thesis	10.00
Graduation Fee	30.00

Unless explicitly stated otherwise, tuition and fees are for one semester and are payable at registration.

Students will not be permitted to take semester examinations until all bills for the current semester have been paid. Nor will a student be permitttted to receive any degree, certificate, or transcript of record until his financial accounts with the University have been satisfactorily settled.

REFUNDS

No refunds may be demanded as a matter of right when a student leaves the University without completing the semester in which he was engaged. If, however, his withdrawal is authorized by the Dean for a good cause and if he is entitled to an honorable dismissal, he may request in writing a refund of tuition. Fees are not refundable.

The following refund schedule will be applied to approved cases:

Date of Notification of Dean	*Refund*
Summer Semester 1968	
To July 8	60%
To July 15	20%
Beyond July 15	No refund
Fall Semester 1968	
To September 21	80%
To September 28	60%
To October 5	40%
To October 12	20%
Beyond October 12	no refund
Spring Semester 1969	
To February 8	80%
To February 15	60%
To February 22	40%
To March 1	20%
Beyond March 1st no refund.	

DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Dr. Lennon, Chairman; Dr. Barrett, Mr. Cannon, Mr. Curtis, Dr. Davis, Dr. Dunstone, Mr. Farrell, Dr. Kenny, Dr. MacDonald, Dr. Marino, Dr. O'Malley, Sister Catherine Elizabeth, Sister M. deChantal, Dr. Stout, Dr. Szuhay, Dr. Walsh, Miss Wolfe.

DEPARTMENTAL REQUIREMENTS

The applicant for admission must possess the baccalaureate degree and provide the committee with evidence of qualitative undergraduate preparation. This means graduation in the upper three-fifths of the class. The student should have completed the ordinary state requirements for certification as a certificated school teacher; of those seeking a master's degree, a B average in undergraduate Education courses is expected. If undergraduate course preparation in Education or the general or liberal studies is deficient as determined by the Departmental Committee on Admissions, the student will correct this deficiency before application to candidacy for the advanced degree.

Applicants for admission into the Rehabilitation Counseling Program will be considered from any undergraduate area of concentration although some emphasis on preparation in psychology is helpful.

COURSE REQUIREMENTS

Before a student requests candidacy status, he will successfully pass the core courses in Education 202, 205-206, with a Grade of B.

CANDIDACY

The criteria for admission to candidacy for the Master's degree are:

1. A formal application will be filed with the Dean of the Graduate School.

2. The graduate student must pass the three core courses (9 credits) with a mark of B in each course. He will only be allowed to repeat any of these courses once.

3. Is approved by the department in the field of his major concentration according to departmental norms.

THE MASTER OF ARTS DEGREE

Thirty semester hours credit are needed for the M.A. degree. Nine of these will be in Education 202, 205-206. Of the remaining twenty-one, three credits are allowed for the successful completion of a thesis, a requirement of the Master of Arts degree.

At the time of candidacy for the degree, the candidate's mentor, in co-operation with the student will plan a program of studies which together with the thesis, will provide a sound treatment of some area of interest. As a result of intensive work in this area, his study should be marked by sound mastery and technical accuracy. The M.A. program may entail requirements prescribed by the mentor, including those essential courses consistent with sound scholarship. The mentor's judgment in this matter is final.

The thesis required for the M.A. degree may be a research paper of suitable dimensions, a critical report of certain procedures or sectors of knowledge, or a schorlarly biographical work on the Master's level.

The student with the permission of the mentor will register for a seminar while working on his thesis.

THE MASTER OF SCIENCE DEGREE

Thirty semester hours or more of course credit are usually required for the M.S. degree, 9, semester hours of which must be in the required courses: Education 202, 205-206. In the Rehabilitation Counseling program, however, fifty-seven graduate credits are necessary. For the M.S. there is no thesis requirement, but a scholarly paper must be presented to the mentor 60 days before graduation. The student may seek the Master of Science degree in any one of the concentrations indicated hereafter.

Before registration the graduate student will meet with his mentor for the selection of a concentration of courses, and the approval of his program of studies. Should the candidate select Plan A, Secondary or Elementary Education, one-half of the program of studies will be in secondary or elementary education and the remainder in a teaching field.

While the candidate's courses within the concentration may possess flexibility, certain essential courses are required. The mentor may make substitutions in order to round out a sound program of courses, and in this matter his judgment is final.

Course Concentrations

SECONDARY EDUCATION

		Semester Hours
Core Courses:		
Education 202	Educational Research and Literature	3
Education 205-206	Historical and Philosophical Bases of Education	6
Specialized Requirements:		
Education 233-234	Curriculum and Modern Methods in the Secondary School	6
Education 272	Human Development and Learning	3
Electives:		
Plan A.		
	English, History, Chemistry or Physics courses	15 hours

The graduate student will include History 237, Teaching of History and Social Science or English 237, Teaching of English Literary Types in Secondary Schools, Chem. 237, Teaching of Chemistry, or Physics 237 the Teaching of Physics, among the non education electives. These same courses may also be scheduled as Education 237.

Plan B:		
	In consultation with his mentor the graduate student may elect 12 semester hours of appropriate courses in Education.	12
	Total	30 33

ELEMENTARY EDUCATION

		Semester Hours	
Core Courses:			
Education 202	Educational Research and Literature	3	3
Education 205-206	Historical and Philosophical Bases of Education	6	6
Specialized Requirements:			
Education 230-231	Curriculum and Modern Methods in the Elementary School	6	6
Education 272	Human Development and Learning	3	3
Electives:			
Plan A:			
	English or History courses		15
Plan B:			
	In consultation with his mentor the graduate student will elect 15 semester hours in Elementary Education. One of these courses must be in Language Arts and one must be in Elementary Mathematics.	15	
	Total	33	33

ADMINISTRATION (Secondary and Elementary)

Since the purpose of this program is to prepare elementary and secondary school principals, it is recommended that the student first complete the program in either elementary education (with elective plan A) or secondary education (with elective plan A).

At the completion of either of these programs he may elect to take his advanced degree in either elementary or secondary education, and

(a) continue to take courses in administration toward the principalship. At the completion of 45 semester hours he would receive a certificate attesting to the completion of the program in administration, or

(b) he may omit taking his degree in elementary or secondary education and complete the entire program in elementary or secondary administration of 45 semester hours when he would be eligible for the M.S. degree in educational administration.

Required Courses in Administration:		*Semester Hours*
Education 221	Basic Administration	3
Education 223	Elementary School Administration (or)	
Education 225	Secondary School Administration	3
Education 227-228	School Law; or School Finance	3
Education 232	Elementary School Supervision (or)	
Education 235	Secondary School Supervision	3
	Total	12

READING

Core Courses:		*Semester Hours*
Education 202	Education Research and Literature	3
Education 205-206	Historical and Philosophical Bases in Education	6

Specialized Requirements:		
Education 253	Educational Measurement	3
Education 291	Developmental Reading	3
Education 292	Diagnosis & Treatment	3
Education 293	Reading Practicum	3
Education 294	Reading Clinic Internship	3
Education 295	Seminar in Reading	3
Education 296	Supervision and Administration of a Reading Program	3

COUNSELOR EDUCATION: * *

Core Courses:

		Semester Hours
Education 202	Educational Research and Literature	3
Education 205-206	Historical and Philosophical Bases in Education	6

Specialized Requirements:

Education 240	Foundations of Guidance	3
Education 242	*Counseling Theory and Techniques	3
Education 244	Counseling Practicum	2
Education 246	Research in Occupational Information	3
Education 254	*Use of Objective Tests in Counseling	3
Education 274	*Developmental Psychology	3
Education 275	*Psychology of Adjustment	3
Elective		3
	Total	32

* There will be some students who do not want to prepare for employment in school systems, but relate to people in some kind of counseling situation. Many of these people are employed in nursing schools, state or private agencies. The mentor will provide a flexible program for these students, but will retain the courses marked with an asterisk.

** Program under restudy. Consult with mentor about possible changes.

REHABILITATION COUNSELING PROGRAM:

Fall		*Semester Hours*
Education 202	Educational Research and Literature	3
Education 251	Educational Statistics	3
Education 273	Community Social Agencies	3
Education 301	Introduction to Rehabilitation	3
Education 308	Guided Field Work in Rehabilitation	3
		15
Spring		
Education 242	Counseling Theory and Techniques	3
Education 253	Educational Measurement	3
Education 302	Rehabilitation Counseling	3
Education 304	Medical Aspects of Disability	3
Education 305	Vocational Evaluation in Rehabilitation	3
		15
Fall		
Education 246	Research in Occupational Information	3
Education 254	Use of Objective Tests in Counseling	3
Education 263	Contemporary Theories of Personality	3
Education 303	Psychosocial Aspects of Disability	3
Education 309	Rehabilitation Counseling Practicum	3
		15
Spring		
Education 310	Internship in Rehabilitation Counseling	12
	Total	57

Certificates for School Counselor

Two kinds of school counselor certificates are obtainable from the Pennsylvania Department of Public Instruction:

A. Provisional Certificate

1. General requirements: The applicant for this certificate must have a provisional certificate to teach; or a Master's degree in guidance counseling; or a Master's degree from an approved school of social work plus an additional six semester hours of course work in professional education. In addition, he must have two years of successful teaching, social work or professional counseling experience.
2. Educational requirements: The applicant must have completed eighteen semester hours of graduate work distributed in the following areas:
   Foundations of Guidance
   *Growth and Development of the Individual in Childhood and Adolescence
   *The Study of the Individual
   Tests and Measurements
   *Collecting, Evaluating and Using Occupational, Educational and Related Information
   Administrative and Community Relationships
   *Techniques used in Counseling
   Group Guidance
   Supervised Experience in Counseling

*Required areas

B. Permanent Certificate

1. General requirements:
   I. A provisional counselor's certificate
   II. Three years of successful counseling experience
2. Educational requirements:
   The Master's degree or its equivalent in the field of school counseling and guidance

It is recommended that wherever possible the student should take more than the minimum number of semester hours of course preparation for the counseling certificate.

C. *Specific Course Requirements for Guidonce Counselor's Certificotes:*

The graduate student should consult with his mentor as to courses acceptable for certification in Pennsylvania or other states.

Principal's Certificates

Principal's Certificates:

I. ELEMENTARY	II. SECONDARY	III. COMPREHENSIVE
1. Provisional	1. Provisional	1. Provisional
2. Permanent	2. Permanent	2. Permanent

I. ELEMENTARY PRINCIPAL'S CERTIFICATE

A. The Provisional Elementary Principal's Certificate will be issued on the following basis — an applicant shall:
   1. Hold a Pennsylvania College Certificate (elementary).
   2. Have three years of successful experience in the elementary school.
   3. Complete forty-five (45) semester hours of graduate study, including a Master's degree with the following minimum requirements:
      a. Twelve (12) semester hours in an academic field other than psychology.
      b. Graduate study in developmental and remedial reading.
      c. Fifteen (15) semester hours distributed among (1) administrative processes, (2) curriculum and instructional processes, and (3) the history and role of the school in society.
      d. Documentary evidence of proficiency in English.

   Renewal

   The Provisional Elementary Principal's Certificate is valid for five (5) years. This certificate may be renewed for two additional five (5) year periods upon satisfactory completion of six (6) semester hours of additional graduate study for each renewal period. This graduate study may be applied toward permanent certification.

B. The **Permanent Elementary** Principal's Certificate will be issued on the following basis:
   1. The Provisional Elementary Principal's Certificate shall be made permanent when the holder of the Provisional Ele-

mentary Certificate has completed five (5) years of successful experience as a principal.

and

2. Has completed at least fifteen (15) semester hours of approved graduate work in addition to the graduate work required for the Provisional Elementary Principal's Certificate. Of these fifteen (15) semester hours of graduate work some time shall be devoted to a study of representative problems in education, of national, state, and local significance.

II. SECONDARY PRINCIPAL'S CERTIFICATE

A. The Provisional Secondary Principal's Certificate will be issued on the following basis — an applicant shall:

1. Hold a Pennsylvania College Certificate (secondary).
2. Have three years of successful experience in the secondary school.
3. Complete forty-five (45) semester hours of graduate study, including a Master's degree with the following minimum requirements:
   a. Twelve (12) semester hours in an academic field other than psychology.
   b. Graduate study in developmental and remedial reading.
   c. Fifteen (15) semester hours distributed among (1) administrative processes, (2) curriculum and instructional processes, and (3) the history and role of the school in society.
   d. Documentary evidence of proficiency in English.

Renewal

The Provisional Secondary Principal's Certificate is valid for five (5) years. This certificate may be renewed for two additional five (5) year periods upon satisfactory completion of six (6) semesters hours of additional graduate study for each renewal period. This graduate study may be applied toward permanent certification.

B. The **Permanent Secondary** Principal's Certificate will be issued on the following basis:

1. The Provisional Secondary Principal's Certificate shall be made permanent when the holder of the Provisional Secondary Certificate has completed five (5) years of successful experience as a principal.

and

2. Has completed at least fifteen (15) semester hours of approved graduate work in addition to the graduate work required for the Provisional Secondary Principal's Certificate. Of these fifteen (15) semester hours of graduate work some time shall be devoted to a study of representative problems in education, of national, state, and local significance.

III. COMPREHENSIVE PRINCIPAL'S CERTIFICATE

A. The Provisional Comprehensive Principal's Certificate valid for both elementary or secondary schools will be issued on the following basis:

1. The Provisional Comprehensive Principal's Certificate will be granted to the holder of a provisional elementary principal's certificate or to the holder of a provisional secondary principal's certificate on the completion of (12) semester hours of approved graduate work in the field for which the original certificate is not valid.
2. The twelve (12) semester hours prescribed above shall be included in the fifteen (15) semester hours required to make the Comprehensive Principal's Certificate permanent.

B. The Permanent Comprehensive Principal's Certificate

1. The Provisional Comprehensive Principal's Certificate shall be made permanent when the holder of the Provisional Comprehensive Principal's Certificate has completed five (5) years of successful experience as a principal in either field, and in addition,
2. Has completed at least fifteen (15) semester hours of approved graduate work in addition to the graduate work required for the provisional elementary principal's certificate, or the provisional secondary principal's certificate.

Certificate for Reading Specialists

Two kinds of certificates are obtainable from the Pennsylvania Department of Public Instruction:

General Requirement: The applicant for either certificate must be an experienced teacher who holds at least the college provisional teaching certificate.

Educational Requirement

Reading Teacher:	*Semester Hours*
Education 253 Educational Measurement	3
Education 291 Developmental Reading	3
Education 292 Diagnosis & Treatment	3

Reading Specialist:

A Master's degree and the following sequence of courses:

Education 253 Educational Measurement	3
Education 291 Developmental Reading	3
Education 292 Diagnosis & Treatment	3
Education 293 Reading Practicum	3
Education 294 Reading Clinic Internship	3
Education 295 Seminar in Reading	3
Education 296 Supervision & Administration of a Reading Program	3

Course Descriptions

FOUNDATIONS OF EDUCATION

Educ. 202. *Educational Research and Literature* — *3 credits*
An introduction to basic principles and major methods used in investigating education problems. Attention is given to the significant steps involved in carrying out a research project. Required of all graduate students for the Master's degree.

Educ. 205-206. *Philosophical and Historical Bases of Education* — *6 credits*
The first half of this course considers in the tradition of philosophy the fundamental problems of the nature of man, the child, the parent, the school, and society. The aims of education in society and their consequences in rights and duties are the most salient problems.
The second half studies the history of education formally. After a brief overview of the classical, patristic, and medieval periods, major attention is given to education in the twentieth century, especially in the United States.

Educ. 210. *Comparative Education* — *3 credits*
The method of this course is both historical and philosophical. Consideration is given to the major characteristics of life, government and culture in western nations, to their effects upon the theory and practice of education and to the interaction of these cultures and educational systems. The educational program of a democracy is compared and contrasted with those of the non-democratic nations. Prerequisite: Education 205-206.

Educ. 211 *A History of Problems in Education* — *3 credits*
This course treats in historical perspective many of the perennial problems of education: politics, philosophy, economics, psychology, curriculum, methods and levels and types of education.

ADMINISTRATION

Educ. 221. *Educational Administration* — *3 credits*
An introduction to general school administration, involving philosophical bases, organization in a democratic society, administration of instruction and personnel.

Educ. 222.1; 222.2; 222.3. *Problems in Administration and Supervision* — *Variable*
A discussion of certain administrative and supervisory practices oriented toward problems encountered in current educational literature and research. This course will be cycled.

Educ. 223. *Elementary School Administration* — *3 credits*
This course treats of the duties and responsibilities of the elementary school principal in the organization and administration of his school. Prerequisites Educ. 221, Educ. 230 and 231.

Educ. 225. *Secondary School Administration* — *3 credits*
This course is designed for principals, departmental heads, supervisors and experienced teachers in secondary schools. It focuses attention on the principles and problems of democratic school management and improvement. It considers such techniques as analysis of classroom procedure, conferences, teacher meetings, community relationships, personnel policies. Prerequisites Educ. 221, Educ. 233 and 234.

Educ. 227. *School Law* — *3 credits*
Focuses attention on the legal background of our education system. It is designed to acquaint school principals and teachers with their legal rights, duties and responsibilities as defined in the school code of Pennsylvania.

Educ. 228. *School Finance* — *3 credits*
An overview of public school finance at Federal, State and local levels. The limitations and advantages of the various sources of revenue will be treated in some detail. Major emphasis will be placed on the practical problems of Pennsylvania or any other State represented in the class, school financing as related to legality, forms, budgets and accounting.

CURRICULUM AND INSTRUCTION

Educ. 230-231. *Curriculum and Modern Methods in the Elementary School* — *6 credits*
Improved methods and procedures in elementary education. Units, problem solving, pupil-teacher planning, inquiry, and the curriculum will be studied. Creativity, individual differences, and pupil interests and needs as related to classroom procedures, materials, and curricula will be considered.

Consideration of basic measurement and evaluation concepts; use and interpretation of standard tests; procedures in test construction; analysis of non-test devices and techniques which can be used in evaluation.

Educ. 232. *Elementary School Supervision* *3 credits*
Methods and techniques in the supervision of the elementary school with the objective of improvement of teaching and learning in terms of modern objectives and methods.

Educ. 233-234. *Curriculum and Modern Methods in the Secondary School* *6 credits*
There is an analysis of traditional and current practices in the secondary curriculum with study as to their improvement. This is followed by a critical review of current and traditional teaching procedures, learning principles, programmed instruction, team teaching, etc., with practice in planning and unit construction. Sound practices in evaluation are emphasized in relation to curriculum and method.

Educ. 235. *Secondary School Supervision* *3 credits*
Methods and techniques in the supervision of the secondary school with the objective of improvement of teaching and learning in terms of modern objectives and methods.

Educ. 236. *Audio-Visual Aids in Education* *2 credits*
Graphic materials and pictures that can be used in teaching are studied. Picture projection is studied as a regular classroom procedure and objective tests are constructed based upon educational films. Other visual aids stressed include school journeys, object-specimens, models, charts, graphs, diagrams, maps. Students in the course will be required to complete successfully a prescribed project. This course is required for permanent certification in Pennsylvania. Laboratory fee $5.00.

Educ. 237.1. *Teaching of History and Social Science* *3 credits*
A consideration of the objectives of social studies, organizing the subject matter, textual and non-textual materials, the social studies curriculum, outcomes and their evaluation.

Educ. 237.2. *Teaching of English Literary Types in Secondary Schools* *3 credits*
Narrative and lyric poetry types, prose types, and drama. Techniques of methodology and organizational patterns are suggested. Listed under Education courses, this offering is taught by the Department of English, as English 238.

Educ. 282. *Language Arts for the Elementary School* *3 credits*
A study of linguistics and the development of language. Emphasis will be placed on techniques for planning, teaching, and evaluating classroom procedures and materials as well as an interrelating of the teaching of each phase of the language arts: **listening, speaking, reading,** and **writing.**

Educ. 283. *Children's Literature for the Elementary School* *3 credits*
Literature for children from kindergarten through the elementary school years. Children's literary needs and interests will be emphasized.

Educ. 284.1. *Seminar in the Communicative Arts: Listening, Speaking, and Reading* *3 credits*
Relationships and issues involving **listening, speaking, and reading** in the elementary school. An opportunity for students to set up and to work on action research projects arising from problems of their elementary teaching and/or elementary supervisary — administrative experiences. (Prerequisite: Education 282 and 283 or by permission of the instructor)

Educ. 284.2. *Seminar in the Communicative Arts: Writing* *3 credits*
Relationships and issues involved in the writing process such as linguistics, spelling the mechanics of writing and creative writing in the elementary school. An opportunity for students to set up and to work on action research projects arising from problems of their elementary teaching and/or elementary supervisory — administrative experiences. (Prerequisite: Education 282 and 283 or by permission of the instructor.)

Educ. 285 *Seminar in Language Arts* *3 credits*
A critical analysis of the research, and issues of the interrelationships of the **Language Arts in the Elementary School.** An opportunity for students to concentrate on the **interrelationships** of the **Language Arts in the Elementary School** and prepare a scholarly research paper for possible publication. (Prerequisite: Educ. 282, 283, 284.1, 284.2 or by permission of the instructor.)

Educ. 286. *Modern Mathematics in Elementary Education* 3 credits
A comprehensive study of modern mathematics in elementary education. The structure and analysis of number systems, sets, equations, number lines, modulo arithmetics, and related topics will be studied.

Educ. 286.1. *Seminar in Elementary School Mathematics* 3 credits
Selected topics and problems in teaching modern mathematics in the elementary school with particular emphasis on individual and small group projects. Prerequisites: Education 286 or permission of the instructor.

Educ. 287. *Social Studies in Elementary Education* 3 credits
A comprehensive study of the social studies program in the modern elementary school. Emphasis will be on children in relation to objectives, curriculum, methods, materials, and evaluation.

Educ. 287.1. *Seminar in Elementary School Social Studies* 3 credits
Selected topics, problems, and recent developments in the teaching of social studies in the elementary school with particular emphasis on individual and small group projects. Prerequisite: Education 287 or permission of the instructor.

Educ. 288. *Science in Elementary Education* 3 credits
Modern science curricula in elementary education. Consideration will be given to scientific processes, organization, planning, methods, materials and evaluation.

Educ. 288.1. *Seminar in Elementary School Science* 3 credits
Analysis of selected topics and problems in teaching and learning science in the elementary school with particular emphasis on individual and small group projects. Prerequisites: Education 288 or permission of the instructor.

RESEARCH

Educ. 290. *Research Seminar* 3 credits
Designed for students who are working on their thesis or other directed research projects. Registration is only with permission of the student's advisor and the Departmental Chairman.

COUNSELING

Educ. 240. *Foundations of Guidance* 3 credits
An introduction to the activities and techniques of guidance programs, with special emphasis on the public schools. Problems of organization, development, and administration of guidance programs will be included.

Educ. 242 *Counseling Theory and Techniques* 3 credits
Attention will be given to the various viewpoints along the directive-non-directive-continuum. Major emphasis will be given to the application of principles to the practical work of the counselor, including the use of observation and interviewing techniques, autobiographies, and the use of records. The student will be expected to refine his ability to analyze and synthesize pertinent information. Prerequisites: Education 240, 246, 254 and 275.

Educ. 244. *Counseling Practicum* 2 credits
Practice Counseling with high school students under supervision. Time is devoted to class discussion and case conferences. Admission is by consent of instructor. Ordinarily a student will have completed Education 240, 242, 246, 254, and 275.

Educ. 246. *Research in Occupational Information* 3 credits
A survey of the fields of work as listed in major occupational classification schemes with special attention devoted to the Dictionary of Occupational Titles. Techniques of assembling and developing occupational materials are discussed. Methods of communicating occupational information to students will receive emphasis. Included will be the contributions of the various theorists concerning the psychology of work and occupational choice.

Educ. 248. *Guidance in the Elementary School* 3 credits
Philosophy, principles and practices of guidance are studied as applied to the elementary school. Guidance services to the elementary student are emphasized.

Educ. 251. *Educational Statistics* 3 credits
Common measures of descriptive statistics, correlation, regression, probability sampling and significance are topics treated in this course. Application is directed toward use in tests and measurement and research studies.

Educ. 253. *Educational Measurement* 3 credits
This is a course devoted largely to the principles and theory of test

construction. Application of these principles to group tests of ability and achievement is made. Prerequisite: Education 251.

Educ. 254 *Use of Objective Tests in Counseling* *3 credits*
Principles of construction and problems of interpretation of group tests of ability, aptitude and achievement. Selected interest and personality (non-projective) assessment instruments and techniques will be included. Prerequisites: Education 251, 253, 275.

PSYCHOLOGY

Educ. 257. *Individual Testing* *3 or 6 credits*
Principles of individual testing as applied to the Stanford Revision of the Binet or Wechsler-Bellevue Scales are discussed. Each student will be required to do a definite number of practice tests. Case write-ups requiring an integration of other related information will be included. Permission of the instructor is required.

Educ. 259. *Introduction to Projective Techniques* *3 credits*
An advanced course in personality assessment for a limited number of graduate students who have completed courses in individual testing and have some experience in counseling. This course is an introduction to principles involved in administering, scoring and interpreting such clinical instruments as the Rorschach Test, The Thematic Apperception Test, Sentence Completion Tests, and graphomotor devices. Admission by permission of the instructor only.

Educ. 262. *Learning Theories* *3 credits*
A treatment of selected, well known learning theories. These are related to the learning process, derived from rational and empirical sources, with the object of showing relationships to teaching. Prerequisite: Educ. 272.

Educ. 263. *Contemporary Theories of Personality* *3 credits*
An orientation to theories of personality, including the history, development and contributions of certain theories. Prerequisite: Education 275 or consent of instructor.

Educ. 268. *The Education of Exceptional Children* *3 credits*
A general view of the field; historical background – both philosophical and legislative; survey of physical, mental and emotional handicaps and of giftedness; remedial and preventive practices; a look at the future.

Educ. 272. *Human Development and Learning* *3 credits*
A treatment of the psychological phases of human development throughout life span with special emphasis upon the interaction of developmental phases with learning and instruction. The importance of childhood and adolescence is stressed.

Educ. 273. *Community Social Agencies* *3 credits*
Study and discussion of the nature, organization and use of community resources in relation to rehabilitation. The availability of these resources through public and private agencies and facilities, including employment potentials. Problems in the development and utilization of community resources.

Educ. 274. *Development Psychology* *3 credits*
An intensive treatment of psychosocial and biological aspects of human development throughout the human life span; implications for behavior in counseling, home, society and school will be stressed.

Educ. 275. *Psychology of Adjustment* *3 credits*
Provides an understanding of adjustive behavior. Attention is given to factors that influence behavior with special attention to the types and etiology of the various emotional disorders.

READING

Educ. 291 *Developmental Reading* *3 credits*
Designed to provide the teacher an insight into the reading program, its methods and instructional techniques. Vocabulary, rate, comprehension, study skills, group and individual diagnostic procedures will be investigated.

Educ. 292. *Diagnosis and Treatment of Reading Problems* *3 credits*
A comprehensive review of reading difficulties, procedures, techniques and instruments for diagnosis and appraisal; case studies; remedial programs for both group and individual children will be reviewed and discussed. Prerequisite: Educ. 291.

Educ. 293 *Practicum in Reading* *3 credits*
A lab course covering diagnosis, case typing, prognosis, personality, capacity, vision, hearing, and recommendations in such areas as informal language inventories, associative learning and memory

span. Experience is provided in techniques, procedures, and preparation of case reports. Prerequisite: Education 291, 292.

Educ. 294. *Reading Clinic Internship* *3 credits*
An internship program in the Reading Clinic open to advanced students who have completed Education 291 and 292 or a basic reading course. This course will include plans for the organization and administration of large reading groups. Registration by permission of instructor only.

Educ. 295. *Seminar in Reading Problems and Literature* *3 credits*
Survey of current problems in reading instruction with emphasis upon research related to these problems. A research paper on one phase of reading instruction is a major requirement. Prerequisite: Permission of the instructor.

Educ. 296. *Supervision and Administration of a Reading Program* *3 credits*
Development and selection methods and materials for setting up a school-wide reading curriculum, supervision of testing, materials, personnel for a reading program. Administrative responsibilities of a reading supervisor will be discussed. Prerequisite: Permission of the instructor.

REHABILITATION COUNSELING

Educ. 301. *Introduction to Rehabilitation Services* *3 credits*
Historical and legal background of rehabilitation. The roles of rehabilitation workers and the nature of resources.

Educ. 302. *Rehabilitation Counseling* *3 credits*
Philosophy of rehabilitation and ethics for the counselor. Appraisal procedures and counseling techniques. Training and placement. Functions as coordinator and liaison person and the administrative and clerical procedures involved in the job.

Educ. 303. *Psycho-Social Aspects of Disability* *3 credits*
Emphasis is placed upon social-psychological situations confronting a person of atypical physique, and how he copes with them. Also considered are the external and internal factors which can aid or hinder psychological adjustment.

Educ. 304. *Medical Aspects of Disability* *3 credits*
Medical evaluation as part of the rehabilitation process. Study of body systems, medical terminology, and description of disabilities of importance to the counselor. Interpretation of medical information in reference to the social, psychological and vocational aspects of disabling conditions.

Educ. 305 *Vocational Evaluation in Rehabilitation* 3 credits
Emphasis is on techniques of vocational evaluation peculiar to rehabilitation such as work samples, job analyses and situational approaches. Evaluation of special groups, blind, asphasic, retarded, emotionally disturbed, etc. will be presented. Field trips to facilities utilizing these approaches will be made.

Educ. 308 *Guided Field Work in Rehabilitation* 3 credits
Directed group observation and discussion of habilitation and rehabilitation services provided in various community agencies: hospitals, clinics, therapy centers, work training centers, schools offering special education.

Educ. 309. *Rehabilitation Counseling Practicum* *3 credits*
Practice and application under supervision of the theory, principles, knowledge and skills to rehabilitation counseling and case management.

Educ. 310 *Internship in Rehabilitation Counseling* *12 credits*
Assignment in community rehabilitation agencies are made during the student's final academic semester. Intership assignments may include work in a district office of the Pennsylvania Bureau of Vocational Rehabilitation, Office for the Blind, private or public agencies serving the retarded, emotionally distured, orthopedically disabled, or culturally disadvantaged. The final semester may be spent in a sheltered workshop, rehabilitation center, hospital, or institute affiliated with the program.

COURSE PROJECTION EDUCATION

Courses	Su 68	Fa 68	Sp 69	Su 69	Fa 69	Sp 70	Su 70	Fa 70	Sp 71	Su 71	Fa 71	Sp 72	Su 72
202	x	x	x	x	x	x	x	x	x	x	x	x	x
205	x	x	x	x	x	x	x	x	x	x	x	x	x
206	x	x	x	x	x	x	x	x	x	x	x	x	x
210		x			x			x			x		
211			x			x			x			x	
221	x	x						x		x			
222 1	x				x		x				x		x
222 2				x					x				
222 3							x			x			x
223	x	x		x	x		x	x		x	x		x
225	x	x			x		x	x			x		x
227			x						x				
228						x						x	
230	x	x	x	x	x	x	x	x	x	x	x	x	x
231	x	x	x	x	x	x	x	x	x	x	x	x	x
232	x		x	x		x	x		x	x		x	x
233	x	x	x	x	x	x	x	x	x	x	x	x	x
234	x	x	x	x	x	x	x	x	x	x	x	x	x
235	x	x					x	x			x		x
236				x				x					x
237 1					x						x		
237 2					x						x		
240	x	x		x	x		x	x		x	x		x
242	x		x			x	x		x			x	x
244			x			x			x			x	
246		x		x	x			x		x	x		
248													
251		x		x	x			x		x	x		
253	x		x			x	x		x			x	x
254		x		x	x			x		x	x		x
257	x		x	x		x	x		x	x		x	x
259	x	x		x			x	x		x	x		x
262	x		x			x	x		x	x		x	x
263		x			x			x			x		
268		x			x			x			x		
272	x	x		x	x		x	x		x	x		x
273		x			x			x			x		
274	x		x	x		x	x		x	x		x	x
275	x		x			x	x		x			x	x
282	x	x			x		x	x			x		x
283		x			x			x			x		
284 1						x						x	
284 2			x						x				
285			x			x			x			x	
286		x											
286 1					x			x			x		
287			x	x					x	x			
287 1						x						x	
288						x	x					x	x
288 1			x					x					
290													
291	x	x	x	x	x	x	x	x	x	x	x	x	x
292	x	x	x	x	x	x	x	x	x	x	x	x	x
293		x			x			x			x		
294		x		x	x		x		x			x	x
295			x			x			x			x	
296			x	x		x			x	x		x	
301		x			x			x			x		
302			x			x			x			x	
303		x			x			x			x		
304			x			x			x			x	
305			x			x			x			x	
308		x			x			x			x		
309		x			x			x			x		
310			x			x			x			x	

DEPARTMENT OF BUSINESS ADMINISTRATION

Dr. Senker, Chairman; Mr. Buckley, Mr. Campo, Dr. Giunta, Mr. Houlihan, Mr. McLean, Mr. Poole, Dr. Strickland, Dr. Zandarski.

DEPARTMENTAL REQUIREMENTS

The applicant for admission must possess the baccalaureate degree in Business Administration and provide the Graduate Advisory Committee with evidence of sufficient undergraduate preparation of good quality in Business Administration or Accounting. If the student possesses a baccalaureate degree other than in Business Administration he will be required to provide evidence that the following undergraduate courses have been successfully completed: Business Law - 3 credits; Accounting - 6 credits; Economics - 6 credits; Corporation Finance - 3 credits; Statistics - 3 credits, and an additional 9 credits in Business Administration or Economics.

COURSE REQUIREMENTS

All students who intend to work for the degree of Master of Business Administration must take a basic core of courses in the field of Business Administration amounting to 12 credits. Students who have had differential calculus will substitute an elective course for Business 209. Eighteen additional credits are required in courses to be elected from the areas of Accounting, Management, Finance, Marketing and Economics. Nine credits must be obtained in one of these fields of concentration, while the remaining 9 may be in any of the other fields. Thus, the total number of credits required for graduation is thirty.

CANDIDACY

Students seeking the M.B.A. degree must, before completing more than nine graduate credits in Business Administration, successfully complete the Admissions Test for Graduate Study in Business Administration. No one will be permitted to continue his credits towards the M.B.A. degree until the candidacy requirements have been met. Non-matriculating students who take courses beyond the first nine credits will be asked to affirm in writing that they do not intend to seek a degree.

PROGRAM IN BUSINESS ADMINISTRATION

Core Courses

Bus. 200	Business Research Methodology
Bus. 205	Managerial Economics
Bus. 209	Mathematics for Business
Bus. 215	Business Policy

Advanced Courses

Bus. 220	Managerial Accounting
Bus. 223	Advanced Accounting Theory
Bus. 225	Accounting Systems
Bus. 242	Quantitative Management
Bus. 244	Labor - Management Problems
Bus. 246	Management of Human Resources
Bus. 260	Marketing Management
Bus. 261	Marketing Research
Bus. 262	Sales and Advertising Problems
Bus. 280	Financial Management
Bus. 281	Financial Institutions
Bus. 283	Investment Analysis
Bus. 290	Business Conditions Analysis
Bus. 291	Advanced Economic Theory
Bus. 293	International Economics

Course Descriptions

CORE COURSES

Bus. 200. *Research Methodology* *3 credits*

Research methods in business and economics, with special attention to research techniques, application of quantitative method, bibliographic sources, and preparation of written research findings. This course should be taken the first time it is offered after the student is admitted to the program.

Bus. 205. *Managerial Economics* *3 credits*

An intensive study of the problems of value and costs, including supply and demand, cost analysis and pricing theories, monopoly and competition, price control and allocation, and policies of the government as they affect prices.

Bus. 209. *Mathematics for Business* 3 credits
An introduction to various mathematical methods useful in the solution of business problems. Topics include simple functions, limits of a function, some differential and integral calculus, and some of their applications to business problems. If the student has passed a course in calculus, he may substitute any elective for this course.

Bus. 215. *Business Policy* 3 credits
Starting with conceptual and institutional foundations of business, the course covers the philosophy, history and ethics of business policy, culminating in the specific areas of policy, accounting, finance, marketing and management. This course should be taken in the last semester of the student's program, and only after all other core and major courses are completed.

ELECTIVE COURSES

Bus. 220. *Managerial Accounting* 3 credits
A study of the accounting techniques and their effective use in managerial organization and administration. Emphasis will be placed on the principles of cost accounting and the statement of application of funds.

Bus. 223. *Advanced Accounting Theory* 3 credits
A study of the theories underlying accounting principles and the application of these theories and principles in specific situations. Current literature taken from various accounting periodicals and recent C.P.A. examinations will be used extensively. Emphasis is placed on the importance of high standards in the accounting profession and its importance to management.

Bus. 225. *Accounting Systems* 3 credits
How to make an accounting survey of a business, select the methods to be used, design the system of procedures and prepare the systems report for businesses of varied types and sizes.

Bus. 242. *Quantitative Management* 3 credits
The quantitative approach to managerial problems of planning and controlling the design and operation of business enterprises. Topics include the use of personal probability as a basis for rational decision making, and operations research techniques including mathematical programming, queues, simulation and inventory theory.

Bus. 244. *Labor-Management Problems* 3 credits
An analysis of the policies of employers, organized labor and the government, in attempting to solve labor-management problems, with an appraisal of the results. Discussions include evaluations of social, economic and legal trends as well as leading cases on the subject.

Bus. 246. *Management of Human Resources* 3 credits
An understanding of manpower development, objectives, and policies involved in a business enterprise as found in a sound industrial relations program.

Bus. 260. *Marketing Management* 3 credits
The many legal, competitive, social and administrative problems which face the marketing executive and the methods and tools used in solving these problems. Factual cases will be used throughout the course.

Bus. 261 *Marketing Research* 3 credits
Research techniques used in solving marketing problems in both motivation and product research, including research methods and design, questionnaire construction, sampling and analysis; the contributions of the behavioral sciences to marketing research.

Bus. 262. *Sales and Advertising Problems* 3 credits
Advertising and the sales efforts as tools of management in marketing industrial and consumer goods and services, and the effectiveness of these tools in achieving their marketing objectives.

Bus. 280. *Financial Management* 3 credits
Principles of policy formulation in the modern corporation; the institutions, instruments and customary procedures that influence the determination of corporate policy; and the reasons for choices in seeking solutions to specific financial problems.

Bus. 281. *Financial Institutions* 3 credits
A detailed survey of the more important financial institutions of the United States in order to determine their functions and interrelations in the national economy, and their importance in the various fields of business administration.

Bus. 283. *Investment Analysis* 3 credits
The investment markets and the financial analysis of various types of investments including industrial, railroad, utility, financial

institution, real estate, government, municipal and foreign securities; the mathematics and mechanics of investments.

Bus. 290. *Business Conditions Analysis* 3 credits
A critical evaluation of gross national product, disposable personal income, population changes, rate of economic growth, and their effects on sales. Methods of forecasting sales of capital goods, durable and non-durable consumer goods.

Bus. 291. *Advanced Economic Theory* 3 credits
The modern economy as a whole in its aspects of total income, aggregate demand, total output and employment, as well as their significant components and determinants. Relationship between micro-macro analysis.

Bus. 293. *International Economics* 3 credits
International trade theories and policy implication, with particular emphasis on present foreign economic policy of the United States. The economic forces and institutions which throw light upon and condition political relationships between nations.

COURSE PROJECTION
&
BUSINESS ADMINISTRATION

Courses	Su 68	Fa 68	Sp 69	Su 69	Fa 69	Sp 70	Su 70	Fa 70	Sp 71	Su 71	Fa 71	Sp 72
200		x		x	x			x			x	
205			x			x	x		x			x
209		x		x	x		x	x	x		x	
215	x		x	x		x			x	x		x
220	x		x					x		x		x
223					x				x			
225	x	x				x				x	x	
242			x			x			x			x
244		x			x						x	
246			x					x				x
260			x				x	x				x
261					x		x		x			
262		x				x					x	
280	x				x			x		x		
281			x						x			x
283		x		x		x					x	
290			x	x			x	x				x
291		x			x						x	
293				x		x	x		x			

DEPARTMENT OF ENGLISH

Dr. Ryan, Chairman; Fr. Lavin, S.J.. Dr. Murray, Dr. Mitchell, Dr. Passon, Fr. Quinn, S.J., Sister Maria del Rey, R.S.M., Mr. Rotondaro, Dr. Tartella:

DEPARTMENTAL REQUIREMENTS

The applicant must, at the time of application, possess a baccalaureate degree and must have completed on the undergraduate upper-division level a minimum of 18 semester hours in English; and must, further, have a Quality Point Index of not less than 2.5 (of a possible 4.0) in the required undergraduate courses. The applicant will not be considered matriculated to candidacy for the degree until he has successfully completed six (6) graduate credits in English and has successfully passed a qualifying examination. This examination may be: 1) the Graduate Record Examination; 2) the Departmental Qualifying Examination of the University of Scranton; or 3) the Senior Comprehensive Examination for English majors of the University of Scranton. The student will then be evaluated by a committee of the Department of English and his acceptance or rejection as a candidate for a graduate degree will be decided. No student may continue to take credits toward a degree until he has been formally notified of his acceptance as a candidate, at which time a mentor will be assigned to him. The regulations determining candidacy, in general, are applicable to both the M.A. and M.S. (correlated) programs.

COURSE REQUIREMENTS

A. Master of Arts in English

Candidates for the degree of Master of Arts in English will be required to complete successfully twenty-seven credits in courses in English, as outlined below, pass a Comprehensive Examination, and present a critical study (dissertation) of 12,000 to 20,000 words. Three (3) hours of credit are allowed for the dissertation.

The specific course requirement for this degree is:

English 200. Introduction to Literary Scholarship and Linguistics (3 credits)

The remaining twenty-four course credits are to be taken in courses approved by the mentor. These courses should be so chosen as to combine student interest in certain periods or genres, and coverage both in range and depth of the field of British and American Literature.

The thirty credit hours necessary for the degree are completed with the three hours of credit for the dissertation.

Some students may wish to major in English and follow a minor in American History, Education, or Psychology. Similarly, those majoring in the three fields noted above may wish to minor in English. For those majoring in English, the following program should be followed:

a) English Major - twenty-four credits
Seven courses in English, including English 200; and a dissertation.

b) Minor - six credits in: History, Education, or Psychology.

Master of Science - Correlated Program

A total of thirty-three hours of credits, distributed between courses in English and Education, will be required for this degree, for which no dissertation is necessary. The candidate must also successfully pass a Comprehensive Examination in both English and Education.

Refer to page 19 for correlated program with education.

If the Master of Arts degree is to be terminal, students will not be required to fulfill a modern language requirement. Nor will there be language requirements for students following the Master of Science (Correlated) program.

Students intending to continue graduate studies elsewhere to the Doctoral level will be required to fulfill a language requirement: any modern language may be offered in fulfillment of this requirement.

Course Descriptions

English 200. *Introduction to Literary Scholarship and Linguistics* *3 credits*
Introduction to the specialized tools of research required of the student of language and literature.

English 203. *Literary Criticism.* *3 credits*
Theory of literary criticism and the principles of literary aesthetics.

English 208. *Advanced Composition.* *3 credits*
The interrelationship of grammar, rhetoric, logic, semantics, and criticism in the communication of ideas. Examines important texts designed to improve and fortify students' techniques in teaching composition. Students participate by writing essays of graduated intensity, length, and depth of subject matter.

English 211. *Survey of Medieval English Literature.* *3 credits*
Critical study of the major genres of the Middle English period, emphasizing the dynamic impulses of the society reflected. Chaucer is excluded.

English 214. *Chaucer.* *3 credits*
a) Chaucer I: Reading of the **Canterbury Tales,** with attention to the medieval culture which they reflect.
b) Chaucer II: Reading of the **Troilus and Cressida** and **The Parliament of Fowls,** with attention to the medieval culture which they reflect.
(a and b are offered alternately.)

English 218. *Spenser.* *3 credits*
Critical study of Spenser's **Faerie Queene,** stressing the literary and intellectual background of the Age of Elizabeth.

English 220. *Shakespeare's History Plays.* *3 credits*
Thorough study of the first and second tetralogies, against the background of English history and Shakespeare's use of his sources.

English 221. *Problems in the Interpretation of Shakespeare.* *3 credits*
Study of the meanings of Shakespeare's major comedies and tragedies.

English 230. *Seventeenth Century English Poetry.* *3 credits*
Metaphysical Poetry of Donne, Herbert, Vaughan, Crashaw, and Marvell, emphasizing the cultural background of the times and the influences on subsequent poetry.

English 231. *Tudor and Stuart Drama.* *3 credits*
Critical study of representative plays by the major Tudor and Stuart dramatists, exclusive of Shakespeare: Marlowe, Jonson, Chapman, Webster, Massinger, Ford, and Shirley.

English 234. *Milton.* *3 credits*
Critical study of Milton's poetical works, his sources and his literary form.

English 236. *Pope and His Age.* *3 credits*
Study of the writings of Pope, Addison, Steele, Swift, Defoe, and others, in the light of the social, political, and intellectual background of the first half of the eighteenth century.

English 238. *Johnson and His Age.* *3 credits*
Study of the writings of Johnson, Boswell, Goldsmith, Burke, Crabbe, and Cowper, in the light of the social, political, and intellectual background of the second half of the eighteenth century.

English 240. *Romantic Poetry and Criticism.* *3 credits*
Examination of the poetry and critical writings of Wordsworth, Coleridge, Byron, Shelley, and Keats, in the light of the Romantic backgrounds of the late eighteenth and early nineteenth centuries.

English 243. *Victorian Poetry and Criticism.* *3 credits*
Study of the major poets and critics of the Victorian Age: Tennyson, Browning, Arnold, Ruskin, and Pater.

English 244. *Victorian Fiction.* *3 credits*
Reading of selected novels of the Brontes, Dickens, Thackeray, Trollope, Meredith, and Thomas Hardy, in the light of the social, political, and intellectual background of the Victorian Age.

English 247. *America in Literature I.* *3 credits*
Colonial and Romantic Periods. A survey of the important writings from the early settlements to the time of the Civil War.

English 250 *Modern British and American Poetry* *3 credits*
Poetic experimentation and development in the work of Hopkins, Yeats, Eliot, Auden, Moore, Frost, Spender, Dylan Thomas, and others.

English 252. *Modern British Fiction.* *3 credits*
Intensive study of British novelists from Hardy to the contemporaries, in the light of the historical, social, and intellectual climate of the age.

English 255. *Modern British and American Drama.* *3 credits*
Study of the major British and American dramatists from the time of the Irish literary revival to the present day: Synge, Yeats, O'Casey, Shaw, O'Neill, Tennessee Williams, and Arthur Miller.

English 258. *America in Literature II.* *3 credits*
Emergence of Realism. An Examination of American Literature from the Civil War to 1920.

English 259. *America in Literature III.* *3 credits*
Modern American Literature. The period from 1920 to the present will be covered, exclusive of the drama.

English 270. *Seminar in Genre* *3 credits*
A concentrated study of a major figure, a limited group of figures, or of a specific genre. Admission to this course by permission of the instructor, on application.

English - Education 237.2 *The Teaching of English Literary Types in the Secondary School.* *3 credits*
Consideration will be given narrative and lyric poetry, prose forms, and drama. Techniques of methodology and organizational patterns are suggested.

GRADUATE COURSE PROJECTION: ENGLISH

Courses	Su. 68	Fa. 68	Sp. 69	Su. 69	Fa. 69	Sp. 70	Su. 70
English 200	x	x		x	x		
English 203	x						
English 208	x						
English 211		x		x			x
English 214			x	x			x
English 220	x				x		
English 221		x		x			
English 230					x		
English 231							
English 234							
English 236							
English 237.2			x			x	
English 238	x		x		x		
English 240		x					
English 243			x			x	
English 244					x		
English 247			x				
English 250	x						
English 252							
English 255				x			
English 258					x		
English 259		x				x	
English 270				x			

DEPARTMENT OF HISTORY

Dr. Dougherty, Chairman; Professor Brown, Professor Scully, Dr. Alexander, Professor Warfle.

DEPARTMENTAL REQUIREMENTS

The applicant must possess the baccalaureate degree and should as an undergraduate have completed a minimum of 18 upper-division semester hours in History, six of which must be in American History. Courses in Government, Political Science or cognate fields may round out the 12 other required undergraduate elective credits. The applicant should have a Quality Point Index of not less than 2.5 in all his undergraduate course work or have attained a score of 500 on the GRE. He will be considered as non-matriculated until he has successfully completed six graduate credits in History and filed formal application for candidacy. His acceptance as a candidate will be decided at that time by the History Department, after their appraisal of his capability for continued growth as a graduate student. No student may continue to take credits toward the degree until he has been notified of his acceptance as a candidate. At that time his mentor will be appointed.

MASTER OF ARTS IN HISTORY

Candidates for the Master of Arts in History will be required to complete successfully twenty-seven credits in courses outlined below, pass the Comprehensive Examination and present an acceptable dissertation for which three credits are allowed. The thesis topic must be approved by the student's mentor under whose active direction the dissertation should be satisfactorily completed. The Degree Candidate will be required to defend his thesis before a committee appointed by the Dean.

Twenty-one of the course credits must be acquired in History, the major field. In the event that significant gaps occur in the student's undergraduate background, additional graduate courses may be specified by the mentor. All students are required to take History 200, and at least three two-semester courses.

Students concentrating in History and selecting a minor in another field may take six credits in English, Education or Psychology. These minor courses should be integrated with the student's program and are subject to the mentor's approval.

MASTER OF SCIENCE-CORRELATED

A total of 33 credits in course will be required of candidates for this degree, for which no dissertation is required. The course distribution will be as follows:

Refer to page 19 for correlated program with education.

CONCENTRATION IN HISTORY AND POLITICS

Hist. 200	Science and Methods of American Historians
Hist. 203	History of the American Presidency
Hist. 205	History of American Federalism
Hist. 208	The American Heritage I
Hist. 209	The American Heritage II
Hist. 210	American Constitutional Law and History I
Hist. 211	American Constitutional Law and History II
Hist. 212	Development of American Civilization I
Hist. 213	Development of American Civilization II
Hist. 214	American Foreign Relations to 1848
Hist. 215	American Foreign Relations: 1848-1920
Hist. 217	American Foreign Relations: 1920 to Present
Hist. 218	Political and Social History I: Colonial America to 1783
Hist. 220	Political and Social History of U. S. II: 1789-1852
Hist. 222	Political and Social History of U. S. III: 1852-1900
Hist. 224	Political and Social History of U. S. IV: 1900-Present
Hist. 228	America in Literature I: The Colonial and Romantic Poets
Hist. 229	America in Literature II: The Emergence of Realism
Hist. 230	America in Literature III: Modern American Literature

Course Descriptions

Hist. 200. *Science and Methods of American Historians* 3 credits

A study and application of the scientific methodology required for gathering, assessing, synthesizing, and documenting historical information. Special attention will be given to the American historians

who typify the distinct traditional approach and to those who represent significant departures from that trend.

Hist. 203. *History of the American Presidency* 3 credits
American Party System in selection of the President will serve as an introduction to a detailed analysis of the office, functions and powers of the Chief Executive.

Hist. 205. *History of American Federalism* 3 credits
Evolution, development and changes in federal and state relations, with an analysis of the forces influencing these changes.

Hist. 208. *The American Heritage I* 3 credits
Influences affecting the development of the American Nation; puritanism and its effect on the colonial experience; controversy occasioned by the Revolution of 1776; Hamiltonian and Jeffersonian ideals at work; implications of the Secessionist and Slave controversies on American institutional life.

Hist. 209. *The American Heritage II* 3 credits
Impact of Reconstruction: Social Darwinism; Imperialism; Liberalism and Conservatism on Contemporary American Institutions form the basis of evaluation and interpretation.

Hist. 210. *American Constitutional Law and History* 3 credits
Emphasis on the bases of American constitutionalism, the Federal Convention, the development of the judicial process, states rights vs. nationalism, Marshall and Taney Courts, and other issues which led to the Civil War.

Hist. 211. *American Constitutional Law and History II* 3 credits
The Fourteenth Amendment will initiate the second phase of this course. Problems dealing with Federalism, civil liberties and religious freedom will be treated.

Hist. 212. *Development of American Civilization I* 3 credits
The leading economic, social and cultural aspects of American life; study of the economic, religious and intellectual bases of colonial American life; the impact of the Revolution; development of towns and country life; sectional differences; early labor movements; growth of democracy and reform movements.

Hist. 213. *Development of American Civilization II* 3 credits
A continuation of the above course from 1865 to the present. The growth of industry, agriculture and agrarian discontent, the waning frontier; labor and immigration; literature and the arts; the diffusion of knowledge, religious tendencies.

Hist. 214. *American Foreign Relations to 1848* 3 credits
Analysis of diplomatic principles by surveying the diplomacy of the American Revolution, the Confederation, and the early years of the Republic. Emphasis will be placed on the treaty making powers in the Constitutional Convention, the Louisiana Purchase, the War of 1812, the Monroe Doctrine and the Mexican War.

Hist. 215. *American Foreign Relations: 1848–1920* 3 credits
A study of the consolidation of America, Manifest Destiny, the Civil War, Expansion of the Far East, the New Manifest Destiny, the Spanish American War, Big Stick Diplomacy, World War I, and the League of Nations.

Hist. 217. *American Foreign Relations: 1920 to the Present* 3 credits
The United States foreign policy since World War I, collective security and disarmaments, the Rooseveltian neutrality, World War II, and the Post War World.

Hist. 218. *Political and Social History I: Colonial America to 1783* 3 credits
European beginnings—the English settlements; colonial society and politics; the struggle for the Mississippi Valley; the War of Independence.

Hist. 220. *Political and Social History of U. S. II: 1789–1852* 3 credits
American internal developments in the early years of the Constitution and the early Presidents, Jacksonian democracy's impact on American life; the impulse toward territorial expansion and the sharpening of regional clashes.

Hist. 222. *Political and Social History of U. S. III: 1852–1900* 3 credits
Analysis of the social, economic and political conditions that resulted in the struggle for Southern Independence; the war years in the North and the South; Reconstruction, big business; organized labor; internal political issues from Andrew Johnson to Theodore Roosevelt.

Hist. 224. *Political and Social History of U. S. IV: 1900 – Present* 3 credits
Tracing American development after 1900, stress will be placed

upon the Roosevelt Era and its Progressivism, Wilson's New Freedom and the problems of World War I. The return to "normalcy," the Great Depression and the New Deal; F. D. Roosevelt and world politics, the origins and aftermath of World War II.

Hist. 228. *America in Literature I: The Colonial and Romantic Periods* 3 credits
Survey of the important writings from the earliest settlements to the Civil War.

Hist. 229. *America in Literature II: The Emergence of Realism* 3 credits
Examination of American Literature from the Civil War to 1920, including the new designs in poetry and the trend towards literary naturalism.

Hist. 230. *America in Literature III: Modern American Literature* 3 credits
The period from 1920 to the present, excluding the drama. Major Novelists, poets and critics to be discussed.

Hist. 237.1 *Teaching of History and Social Science* 3 credits
A consideration of the objectives of social studies, organizing the subject matter, textual and non-textual materials, the social studies curriculum, outcomes and their evaluation.

COURSE PROJECTION – HISTORY

Courses	Su 68	Fa 68	Sp 69	Su 69	Fa 69	Sp 70	Su 70	Fa 70	Sp 71
200		x	x	x		x		x	
203	x						x		x
205			x	x					
208		x						x	
209			x						x
210					x				
211						x			
212					x				
213						x			
214		x						x	
215			x						x
217	x				x		x		
218	x						x		
220	x						x		
222									
224				x					
228			x	x				x	
229					x				x
230		x				x			

DEPARTMENT OF CHEMISTRY

Dr. Burti, Chairman; Dr. Appleton; Dr. Haab; Fr. Thoman, S.J.; Dr. Hart; Fr. Casey, S.J.

DEPARTMENTAL REQUIREMENTS

The applicant must, at the time of application, possess a baccalaureate degree and have ordinarily completed on the undergraduate level General and Analytical Chemistry and one full year's course in each of the following: Organic Chemistry, Physical Chemistry, General Physics, and Mathematics through Integral Calculus. Further, the applicant must have an over-all Quality Point Index of 2.5, with 2.5 in the Chemistry and other Science Courses. Certain of these qualifications may be waived at the discretion of the Department Chairman.

Students with limited course deficiences in undergraduate preparation may be admitted with the approval of the Chemistry Faculty but should correct such deficiences concurrently with their initial graduate courses.

The applicant will not be considered matriculated to candidacy for the degree until he has successfully passed a qualifying examination. No student may continue to take credits toward a degree until he has been formally notified of his acceptance as a candidate. The regulations are applicable to both the M.A. and M.S. programs.

COURSE REQUIREMENTS

A. Master of Arts in Chemistry

Candidates for the degree of Master of Arts in Chemistry must complete successfully 24 credits in Chemistry, as outlined below, pass a Comprehensive Examination, and present a thesis demonstrating a distinct contribution to the field. Six (6) credit hours are allowed for the thesis which must be defended.

The specific course requirements for this degree are: Chem. 191, 202, 211, 221, 222, and 242. In addition, a basic laboratory course in the student's field of specialization will be taken unless sufficient preparation in advanced techniques is established. Attendance at Departmental Seminars is mandatory. An additional six (6) credits may be selected from elective courses in the student's field of specialization (analytical, biochemistry, organic, or physical). Research under the Mentor's direction culminates in a thesis which must be defended before the chemistry faculty.

A special five year program leading to the Master of Arts degree has been developed to enable a high school graduate to obtain his Bachelor of Science and Masters Degree in Chemistry within this prescribed period. Undergraduates in Chemistry may apply for acceptance into 5 year program upon completing their freshman year. Inclusion in the program involves accelerated study during the following (2) years and the student will be expected to spend at least one entire summer, usually in his junior year, anticipating some of the usual undergraduate requirements. The senior year is divided equally between concluding undergraduate requirements and initiating fundamental or core courses of the graduate curriculum. Research, forming the bases of the thesis, will be initiated in the summer following the senior year and continue for two (2) subsequent semesters. In the fifth (5th) year, elective graduate courses for the degree are completed.

For the Master of Arts degree, success in a German, French or Russian reading examination is also one of the requirements.

B. Master of Science in Chemistry

The Master of Science Degree is awarded for successful completion of a non-thesis program.

A student accepted for graduate study under this program clears qualifying examinations as above and similarly plans his program. Again, limited deficiencies are corrected prior to or concurrently wth graduate studies.

In this program thirty (30) course credits will be required. Core courses, as above, are: Chem. 191, 202, 211, 221, 222, and 242. Additional elective courses totaling 12 credits complete the program. To provide for flexability in the program and the undergraduate needs, one or more graduate courses in mathematics or cognate sciences may be taken as electives.

No thesis or language examination is required but comprehensive examinations are an integral part of the degree requirements.

C. Correlated Master of Science in Secondary Education — Chemistry

The correlated Master of Science Degree in Secondary Education — Chemistry is designed for the professional improvement of secondary school teachers.

After acceptance for graduate study and qualifying examinations, an integrated course of studies is arranged under the Mentor's direction. Limited deficiencies in Chemistry preparation or background will be remedied prior to or concurrently with graduate studies.

Thirty-three credits are required for the degree of which fifteen (15) will be in Chemistry and eighteen (18) in graduate education courses. The required courses in Chemistry are: Chem. 202, 221, and 241. An additional 6 credits of electives in graduate chemistry are acceptable.

Neither a thesis nor a language requirement must be fulfilled, but comprehensive examinations in Chemistry and Education are prescribed.

Course Descriptions

Chem. 202. *Advanced Inorganic Chemistry* *3 credits*
Theoretical concepts and their application to the reactions and structure of inorganic compounds. Introduction to co-ordination chemistry. Coordination chemistry and related topics; physical methods, reaction mechanisms.

Chem. 211. *Advanced Analytical Chemistry* *3 credits*
Theory and description of modern analytical techniques with emphasis on physico-chemical measurements, including the limitation of physical and chemical separation techniques, and rates and mechanisms of analytical reactions.

Chem. 213. *Electro-Analytic Chemistry* *3 credits*
Theory and applications of potentiometry, polarography, amperometry, coulometry, mass spectrometry and other analytical methods.

Chem. 214. *Applied Spectroscopy* *3 credits*
Theory and applications in chemical analysis of emission spectroscopy, flame photometry, ultraviolet, visible and infrared spectrophotometry, fluorometry and various x-ray methods.

Chem. 218. *Analytical Methods* *1 credit*
Laboratory practice with special analytical apparatus and methods used for process and control, and for research.

Chem. 221-222. *Advanced Organic Chemistry* *6 credits*
A survey of synthetic and theoretical organic chemistry at an advanced level, with emphasis on stereochemistry and mechanism.

Chem. 223-224. *Theoretical Organic Chemistry* *6 credits*
The relation of structure to reactivity. The various reaction types and their mechanisms. Transition-state theory. Molecular rearrangements.

Chem. 228. *Organic Preparations* *1 credit*
Laboratory performance of a number of typical organic syntheses, with an emphasis on the most modern techniques.

Chem. 233-234. *Biochemistry* *6 credits*
Chemistry of carbohydrates, lipids, proteins and nucleic acids. Mechanisms and kinetics of enzyme action. A study of the metabolism, digestion and absorption of carbohydrates, lipids, amino acids and proteins.

Chem. 237.3. *Teaching of Chemistry* *3 credits*
Use of modern methods in the teaching of Chemistry on a secondary level. Recent developments in the treatment of subject matter, including advances in laboratory techniques and demonstration methods. Review of concepts of research as they apply to Chemistry.

Chem. 238. *Biochemical Preparations* *1 credit*
Application of modern theories to biological chemical methods. Spectroscopy, chromatography, polarimetry, electrophoresis, ionophoresis. Applied problems in biochemical research using modern biochemical methods.

Chem. 241-242. *Advanced Physical Chemistry* *6 credits*
A comprehensive treatment of modern aspects of physical chemistry. The application of chemical thermodynamics to thermochemistry and chemical equilibrium. Advanced concepts of the theories of atomic and molecular structure. Quantum theory and introduction to wave mechanics.

Chem. 243. *Chemical Kinetics* *3 credits*
The mechanics of chemical reactions as revealed by various methods. Rate measurements and photo-chemical experiments are discussed. Topics include transition state theory and collision theory, unimolecular reactions, ionic reactions, modern experimental approaches to the nature of the transient intermediates and elementary reactions, molecular structure and reactivity, catalysis, tracer studies, hydrodynamics and kinetics, combustion and detonation.

Chem. 244. *Statistical Thermodynamics* *3 credits*
A vigorous treatment of the applications of the laws of thermodynamics to chemical systems, including an introduction to statistical mechanics, with emphasis on the statistical interpretation of thermodynamic partition functions and the reversible and irreversible thermodynamic behavior of chemical substances.

Chem. 251. *Seminar* *1 credit*

Chem. 251. *M.A. Thesis* *variable up to 6 credits*

GRADUATE COURSE PROJECTION: CHEMISTRY

Courses	Fa 67	Sp 68	Su 68	Fa 68	Sp 69	Su 69	Fa 69	Sp 70	Su 70	Fa 70	Sp 71	Su 71	Fa 71	Sp 72
202		x			x			x			x			x
211	x		x	x		x	x			x			x	
213				x			x			x			x	
214		x			x			x			x			x
218	x	x	x	x	x	x	x	x	x	x	x	x	x	x
221	x		x	x		x	x			x			x	
222		x			x			x			x			x
223				x			x			x			x	
224					x			x			x			x
228	x	x	x	x	x	x	x	x	x	x	x	x	x	x
233				x			x			x			x	
234					x			x			x			x
237.3				x		x			x				x	
238	x	x	x	x	x	x	x	x	x	x	x	x	x	x
241	x		x	x		x	x			x			x	
242		x			x			x			x			x
243					x			x			x			x
244							x			x			x	
251		x			x			x			x		x	
255	x	x	x	x	x	x	x	x	x	x	x	x	x	x

DEPARTMENT OF PHYSICS

Dr. McGinnis, Chairman; Dr. Srivastava, Dr. Fahey, Dr. Hussain, Mr. Keffer, Mr. Kalafut, Mr. Murray (on leave). Mr. DiStefano.

DEPARTMENTAL REQUIREMENTS

The applicant for admission must possess the Baccalaureate degree in Physics or a related field in Engineering. An overall quality point average of 2.5 is required with a 2.7 average in the Physics and Mathematics courses. The applicant will ordinarily be epected to have completed as an undergraduate at least 24 credits in Physics. Included in these courses should be at least three upper division courses in Mechanics, Electricity, Modern Physics or Optics. Besides the above requirements in Physics, the applicant is expected to have at least one Mathematics course beyond the Differential Equations, Advanced Calculus preferred. Students with limited course deficiencies in undergraduate preparation may be admitted with the approval of the Physics faculty but must correct such deficiencies concurrently with their initial graduate courses. Matriculation to candidacy in the Graduate School will be deferred until admission requirements have been successfully accomplished.

COURSE REQUIREMENTS

A. Master of Arts in Physics

Candidates for the degree of Master of Arts in Physics will be required to complete successfully 30 graduate credits and pass a comprehensive examination. Included in these 30 credits is a research dissertation for which a maximum of six credits may be allowed.

Physics courses 200, 201, 202, 210 and either 206 or 208 will be required of all candidates for this degree.

B. Master of Science in Physics

Candidates for the degree of Master of Science in Physics will be required to complete 30 graduate credits in approved courses and pass a comprehensive examination. Of these credits 18 to 24 must be in Physics and must include Physics 200 and 201. Six to Twelve credits, if approved by the Physics department, may be followed in allied Science or Mathematics courses.

C. Master of Science — Correlated Programs

Candidates for the Master of Science degree in the program correlated with Education must complete 33 graduate credits and pass comprehensive examinations. Of these 33 credits, 15 will be required in Physics and 18 in graduate education.

Course Descriptions

Physics 200. *Quantum Mechanics 1* *3 credits*
Basic postulates of Quantum Mechanics. The Schrodinger Wave Equation. Solution of the wave equation in one dimension. Separation of the time dependent equation. The solution of Schrodinger's equation in three dimensions with application to the hydrogen atom. Calculations using the wave function. Prerequisite — Advanced Calculus and Intermediate Mechanics.

Physics 201. *Quantum Mechanics 2* *3 credits*
Use of variation methods as an approximate method of solution. The solution of the Helium atom. Introduction of the angular momentum operator. Perturbation theory. Harmonic perturbations. Time dependent perturbation theory. The solution for the case of the diatomic molecule. The relativistic wave equation and the origin of electronic spin. Prerequisites: Physics 200.

Physics 202 *Nuclear Physics* *3 credits*
Nuclear forces, nuclear masses and stability, radio-activity. Ionizing effects of particles and photons; detectors and energy measurements, determinaiton of decay schemes. Alpha ray decay, decay schemes; relation between decay energy and half-life. Fermi and other theories of beta decay. Theory of the neutrino. Prerequisite: Intermediate course in Modern Physics.

Physics 203. *Neutron Physics* *3 credits*
Nuclear structure, nuclear spin; nuclear magnetic effects. Nuclear reactions with protons, alpha particles and neutrons; induced radioactivity with neutrons; sources of neutrons; neutron detection. Nuclear fission. Prerequisite: Physics 202.

Physics 204 *Electronic Systems* *3 credits*
Applications of electronic circuitry in physical measurement. Pulse systems in nuclear measurements and in computers; servo-mechanical control system; feed back loops. Prerequisite: Intermediate course in Electronics.

Physics 205. *Electronic Systems* *3 credits*
Vacuum tube and transistor circuits for instrumentation and measurement. Pulse counters; binary and decade scalars; forward and reverse counters. Vacuum tube and other high impedance voltmeter circuits. Integrating circuits; count rate meters. Coincidence circuits, switching circuits; Cathode ray dsplay circuitry. Prerequisite: Intermediate course in Electronics.

Physics 206. *Solid State Physics* *3 credits*
The crystal state of matter; crystal conduction; lattice energies and vibrations; elastic constants; ionic conduction. Properties of metal alloys; free electron theory of metals; metallic conduction. Band theory of solids, conduction in solids. Magnetic properties of solids, diamagnetism, paramagetism, ferromagnetism. Co-requisites: Physics 200.

Physics 207. *Semiconductor Physics* *3 credits*
Theory of semiconductors and semiconductor devices. Dielectric and optical properties of insulators, electron distribution in insulators and semiconductors, electron conduction in semiconductors; non-polar semiconductors, semiconductor diodes; Theory of transistor action. Prerequisite: Physics 206.

Physics 208. *Statistical Mechanics* *3 credits*
Development of the concepts and methods of classical and quantum statistical mechanics. The statistics of Boltzmann, Bose-Einstiein, and Fermi-Dirac and their application to systems in Physics and Chemistry. Prerequisite: Advanced Calculus.

Physics 209. *Electromagnetic Theory* *3 credits*
Applications of Maxwell's equations, Lorentz equations of electrodynamics. Classical theories of dispersion, magnetism and conductivity. Prerequisite: Intermediate course in Electricity.

Physics 210. *Advanced Dynamics* *3 credits*
Variational principles and Lagrange's equations. The two body central force problem. Rigid body kinematics. Special relativity. Hamilton's equations of motion and cannonical transformations. Small oscillations and normal coordinates. Prerequisites: Physics 123.

Physics 211. *Mathematical Physics* *3 credits*
A course for beginning graduate students in mathematical methods of theoretical Physics. Topics covered include: Wave equations and their solutions, Polynomial solutions to the Heremite, Legendre and Laguerre Equations; Wave propagation, boundary value problems and variational principles; Legendre and Laguerre Equations; Wave propagation, boundary value problems and variational principles; Lagrange and Hamilton formulations of dynamics, Hamilton-Jacobi theory, linear transformations and matrices.

Physics 215. *Experimental methods* *3 credits*
Experiments in optical spectroscopy infrared spectrophotometry, nuclear magnetic resonance, laser optics. Mossbauer effect and beta and gamma ray spectrometry. Each student is expected to perform representative experiments in all areas listed above and to pursue at least one area in depth in order to make some significant improvements or contribution to techniques. Students will make their own study of references to experimental methods and equipment under guidance and write a comprehensive paper on his work.

Physics 237.4. *Teaching of Physics* *3 credits*
Use of modern methods and classroom aids in the teaching of Secondary School Physics. Accent on recent developments in the field of Physics. Introduction to some of the research tools used in Physics.

Physics 250. *Master's Thesis* *Variable*
Bases on theoretical or experimental research. Student subject to oral examination by Physics staff members.

Physics 251. *Seminar* *1 credit*

GRADUATE COURSE PROJECTION: PHYSICS

Courses	Su 67	Fa 67	Sp 68	Su 68	Fa 68	Sp 69	Su 69	Fa 69	Sp 70	Su 70	Fa 70	Sp 71
102							x			x		
123							x			x		
200		x			x			x			x	
201			x			x			x			x
202					x						x	
203						x						x
204								x				
205									x			
206		x						x				
207			x						x			
208					x						x	
209								x				
210						x						x
211	x						x			x		
215				x		x						x
250												

UNIVERSITY OF SCRANTON

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